

# RECLAMATION

*Managing Water in the West*

**Technical Report for Idaho Department of Fish and Game  
Permit No. F-10-99**

## **Deadwood River Bull Trout Investigation**

**Annual Report for 2005**



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# **Deadwod River Bull Trout Investigation**

**Annual Report 2005**

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*by*

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# **Chapter 1. Fish Movement in Response to Dam Operations**

## **Summary**

This report describes the work and accomplishments of the personnel at Boise State University during the period of 19 February 2005 to 30 September 2005. The objectives of this period were to complete project design and field data collection. We developed a research plan that described our approach to accomplishing the objectives outlined in the cooperative grant agreement. This plan was also the basis for field data collection for a thesis project at BSU. This report summarizes the activities related to field data collection for the past year and includes a copy of the thesis research plan as an appendix.

## **Project objectives**

The objectives of the project for the period of 19 February 2005 to 30 September 2005 were completion of Ms. Sarah Rose's graduate project proposal (Appendix A), completion of data collection, and continued progress in Ms. Rose's graduate program at Boise State University.

We collected input from USBR, USFS, and IDFG representatives to review logistical aspects before final draft of the proposal and procurement of research materials. The objectives of the graduate thesis study are 1) to describe the extent and patterns of movement of rainbow trout in relation to instream discharge and water temperature downstream from Deadwood Dam; 2) describe the effects mainstem discharge and temperatures on out-migration of tributary-resident fishes; and 3) monitor behavior in relation to mainstem and tributary discharge and temperature levels upstream and downstream of Deadwood Dam. For a more complete view of graduate student objectives refer to Appendix A.

## **Modifications to USBR and BSU objectives**

During a preliminary data collection effort in 2004 no migratory bull trout *Salvelinus confluentus* were located in the Deadwood River downstream from Deadwood Dam. Therefore we worked with Reclamation and IDFG personnel to refine the project objectives. The goal of the study became to describe the movement of salmonids within and between tributaries and the mainstem of the Deadwood River. We used rainbow trout *Oncorhynchus mykiss* as the study species because of their ubiquity in the watershed and the fact that this species has been well studied in western North America. In addition to rainbow trout we also collected cutthroat trout *O. clarkii* and hybrids of the two species. Mountain whitefish *Prosopium williamsoni* and bull trout were not collected in the initial radio tagging effort of fishes downstream of Deadwood Dam.

Refinements were also made in the methods associated with processing fish at weirs, ground tracking, and snorkeling. The high initial numbers of rainbow trout moving upstream in Wilson Creek lead to a change in marking methods of trout. Instead of insertion of passive integrated transponder (PIT) tags into every fish, the methods were revised to a series of fin clips with PIT tags inserted in fish moving downstream into the mainstem only. Due to time restraints ground tracking was only conducted once per week. Aerial tracking was substituted to help locate fish outside of the main study area and to insure fish were tracked at least twice per month. Snorkeling to monitor fish behavior was conducted only in tributaries due to safety concerns, inability to locate and observe trout in the mainstem reaches, and time constraints. Snorkeling was not initiated until the end of July.

## Field Project timeline

### Study set-up

Start of field season.....	06 June 2005
Collection of downstream radio tagged fish.....	08-15 June 2005
Collection of upstream radio tagged fish.....	28 June-01 July 2005
Collection of IDFG weir radio tagged fish.....	08-30 August 2005
Downstream fixed site operational.....	07 June 2005
Upstream fixed site operational.....	01 July 2005
First day ground radio-tracking.....	17 June 2005
First day flight radio-tracking.....	15 July 2005
Insertion of tributary weirs	
Wilson Creek.....	13 June 2005
Warmsprings Creek.....	13 June 2005
Deer Creek.....	22 June 2005
Weir insertion depletions	
Wilson Creek.....	15 & 30 June 2005
Warmsprings Creek.....	15 June 2005
Deer Creek.....	29 June 2005
Insertion of flow stage gauges and thermographs.....	4-5 July 2005

### Data collection (summer weekly schedule)

Weir data (3.5 hrs per day).....	Daily
Ground tracking (3.5 hrs per week).....	Monday
Flight tracking (3.5 hrs per week).....	Tuesday or Wednesday
Fixed site download (2.0 hrs per week)	
Upstream site.....	Monday
Downstream site.....	every other Thursday
Snorkel behavior (4.0 hrs per week).....	Wednesday
Instream flows (2.0 hrs bi-weekly).....	every other Tuesday
Thermograph data download (1.5 hrs per month).....	once per month
Radio tagging fish at IDFG weir (1.0 hr per fish).....	when captured

### Data collection (fall weekly schedule)

Weir data (3.5 hrs per day) .....	Daily
Ground tracking (3.5 hrs per week).....	Saturday
Flight tracking (3.5 hrs per week) .....	Tuesday or Wednesday
Fixed site download (2.0 hrs per week)	
Upstream site.....	Saturday
Downstream site.....	every other Sunday
Snorkel behavior (4.0 hrs per week) .....	Monday
Instream flows (2.0 hrs bi-monthly) .....	every other Sunday
Thermograph data download (2.0 hrs per month).....	27-29 September 2005
Radio tagging fish at IDFG weir (1.0 hr per fish).....	when captured

### Field study completion

End of field season.....	Determined by tag life
Downstream fixed site removal.....	17 September 2005
Upstream fixed site removal.....	18 September 2005
Last day ground radio-tracking .....	20 September 2005
Last day flight radio-tracking.....	late October, 2005
Removal of tributary weirs	
Wilson Creek.....	17 September 2005
Warmsprings Creek.....	17 September 2005
Deer Creek.....	18 September 2005
Weir removal depletions	
Wilson Creek.....	17 September 2005
Warmsprings Creek.....	17 September 2005
Deer Creek.....	18 September 2005
Removal of flow stage gauges and thermographs.....	27-29 September 2005

### Completion of thesis and project report (projected)

First thesis draft.....	Early January 2006
Written thesis for BSU.....	Mid-March 2006
Presentation of thesis at BSU.....	early April 2006
Written report for USBR.....	late April 2006
Graduation .....	13 May 2006

## **Summary of field data**

### Telemetry data

Fish collection was initiated 6 June 2005 in the downstream study section of Deadwood Dam. This section was further divided into two sections to spread locations of released fish. Lower Deadwood River near Wilson Creek (LDWL) section is located downstream from the dam past the Wilson Creek confluence to a midpoint selected from USGS 7.5 minute map. Lower Deadwood River near Warmsprings Creek (LDWM) section is from midpoint to the confluence of Warmsprings Creek. Hook and line sampling proved an ineffective method of collection from 6 June 2005 to 8 June 2005, in which no fish were captured. Adequate numbers of fish were collected in the downstream study section using electrofishing. Rainbow trout were collected, radio tagged, and released from 08 June 2005 to 15 June 2005 (Table 1). Operation of the lower Deadwood fixed receiver site started on 07 June 2005 and was downloaded every other week. Radio tracking of fish started on 17 June 2005 and continued through October 2005. Fish were tracked from the ground twice per week. Aerial tracking was initiated later in the study in order to cover the entire study basin. After the initiation of aerial tracking, ground tracking was conducting once per week.

Upstream of Deadwood Dam rainbow trout and cutthroat trout were collected by hook and line sampling within 300 m of Deer Creek confluence and captured in Deer Creek confluence weir moving downstream into the Deadwood River from 28 June 2005 to 01 July 2005. Due to low numbers of fish captured at start of study, mortalities, and movement of all radio-tagged fish into the reservoir, trout were collected and radio tagged at the IDFG weir located in the

Deadwood River 200 m upstream of the reservoir (Table 1). Because the IDFG weir was designed to capture upstream migrants, we hoped that fish collected and tagged at this weir would not immediately enter the reservoir and therefore be lost. Operation of the upper Deadwood fixed receiver site started on 1 July 2005 and was downloaded weekly. Radio tracking of upstream fish started on 5 July 2005 and continued through October 2005. Vitality checks were made on fish that did not appear to move several times during the field season. For a complete map of study area see Appendix A, Figure 1.

#### Tributary depletion data

Electrofishing depletions between confluence and upstream weirs were completed for all study tributaries from 15 June to 30 June and 17 September to 18 September 2005. Depletion removal was used to calculate biomass between the mainstem to the upstream weir traps of study tributaries at time of weir insertion and removal. Three depletions were performed in Wilson Creek due to sampling problems. Fish captured in June were weighed, measured for total length and fork length, a scale sample was collected, and all trout received a PIT tag. Fish captured in September were checked for a PIT tag, weighed, measured for total length and fork length. Estimates of captured fish are tabulated in Table 2a and Table 2b.

#### Weir data

Data was collected on all tributary weirs since installation (13 June 2005 to 15 June 2005). The Deer Creek weirs failed from 16 June 2005 to 21 June 2005 due to high flows. Fish data collected from weirs includes species, length (total and fork), weight, and direction of fish movement. During the fourth and fifth week of the project, marking protocols were changed and a combination of fin clips was used instead to denote capture location with PIT tags inserted only into fish moving downstream from the confluence weirs. Due to the amount of scale samples collected at the Wilson Creek weirs the first four weeks, scale samples were collected for previously PIT tagged fish and rainbow trout and cutthroat trout collected at Warm Springs Creek and Deer Creek for the duration of the study. The high numbers of trout that moved through the Wilson Creek weirs negated the need for additional scale samples at this study tributary. A summation of fish collected at the weirs from 12 June 2005 to 18 September 2005 is included (Table 3 through Table 5).

#### Flow and temperature data

Discharge released from Deadwood Dam was monitored through USBR-Hydromet (Figure 1). Discharge of tributaries and the upstream section of the Deadwood River were measured every two weeks and daily stream gauges were placed upstream of Deer Creek confluence in the mainstem and in the three tributaries 10 m to 20 m upstream of the upstream weir dependent on stream gradient. To date, bi-monthly discharge has not been calculated and correlated with daily stream gauge readings.

Temperature of downstream study section was monitored using the USBR-Hydromet (Figure 2) and a thermograph located 100 m upstream of Warm Springs Creek confluence. Warm Springs Creek and Wilson Creek had thermographs placed by flow gauges. Thermographs were downloaded once per month. To date, thermograph data have not been analyzed. Upper Deadwood River and Deer Creek have two archival temperature tags (Lotek) glued to 2 in. white PVC end caps placed by each flow gauge. Archival tags were used due to lack of availability of thermographs. Archival tags were downloaded at the end of the field season, late October 2005.

### Snorkeling data

Monitoring of fish behavior was collected on five dates from 27 July through 11 September 2005. Data were collected between confluence and upstream weirs located on study tributaries. Data included approximate fish length, channel use, time fish was moving within habitat unit, aggressive attacks initiated and/or received, and number of benthic and drift feeding attempts. The first 10 trout encountered were observed for 5 minutes and data were transcribed at the end of each observation period. If 10 trout are not observed within a section, a note was recorded on data sheet. These data have not been analyzed.

## **Chapter 2. Radio telemetry work in bull trout.**

### **Summary**

Four bull trout were captured in or near Deadwood Reservoir in 2005. Three were implanted with radio tags. Movement of bull trout was limited to the lower 5 km of Trail Creek and the mouth and transition zone of the Deadwood River. Two of three fish were found killed before the end of 2005 and the remaining fish has moved little. Validation of mortality has been difficult due to access and determination of movement and entrainment patterns with the sample size and variation was not possible with this sample.

### **Objectives**

The purpose of the radio telemetry work was to determine movement patterns of bull trout using Deadwood Reservoir and to determine levels of entrainment and thresholds of operations that may lead to entrainment.

### **Results**

One bull trout was captured downstream of the dam, but was too small to be implanted with a tag. Two gravid adult male bull trout were captured by Idaho Department of Fish and Game trap nets moving into Trail Creek in 15 Aug 2005 and received radio tags. One bull trout was captured and radio tagged moving up the main Deadwood River 7 Aug 2005. Movement of all bull trout was relatively limited, though both Trail Creek fish moved as far upstream as Daisy Creek by mid-September, and began to return to the reservoir by the first week of October. Fish 41 was found killed on 2 November 2005 approximately 500 m upstream of the mouth of Trail Creek. This fish was presumably killed by a raptor based on the surrounding area littered with kokanee carcasses and location of the tag when found. Fish 45 began transmitting a mortality signal in the upper end of Deadwood on 7 December 2005. We have been unable to access the area to confirm mortality or cause. Fish 80 (tagged in the mouth of Deadwood) remained within 1.0 km of the tagging area throughout the winter. It was last confirmed active and moving on 2 November 2005 but has remained in the same area of the reservoir throughout the winter.

### **Conclusions and Recommendations**

We found that bull trout moved out of the reservoir much later than was found in the Boise River system, possibly due to differences in thermal habitat suitability and distance to spawning habitats. Few conclusions can be drawn from this limited samples size. The high mortality experienced in the fish that were tagged also made conclusions for long term movement patterns impossible to determine. We recommend increasing the trapping time frame from July through November and also trapping additional creeks where bull trout have been found (Beaver Creek complex, Deer, and upper Deadwood). Additionally, trapping should occur below Deadwood

Dam in conjunction with genetic analysis and assignment to determine entrainment. Allen (1998) also found movement for fish tagged from reservoir trapping was associated with Trail Creek, inferring the importance of this creek to the persistence of a migratory population that uses Deadwood Reservoir. Genetic assignment of fish using Deadwood Reservoir to tributary creeks can be completed to determine the level of contribution to the population of the various watersheds; and may assist with prioritization of recovery areas.

### **References**

Allen, Dale, B. 1998. Deadwood River Bull Trout Study Interim Report for 1997 Studies. Idaho Department of Fish and Game, Southwest Region, Nampa, Idaho. March 1998 IDFG 98-10



Table 1. Radio tagged rainbow trout fish captured and released in Deadwood River, downstream and upstream of Deadwood Dam.

Location	Frequency, code		Total Length (mm)	Weight (g)	Release Date
Downstream <sup>a</sup>	148.800	037	184	66.0	8 June 2005
Downstream <sup>a</sup>	148.340	019	193	60.0	8 June 2005
Downstream <sup>a</sup>	148.780	028	193	60.0	8 June 2005
Downstream <sup>a</sup>	148.340	010	177	58.0	8 June 2005
Downstream <sup>a, d</sup>	148.340	011	220	94.0	8 June 2005
Downstream <sup>a</sup>	148.800	032	210	105.8	13 June 2005
Downstream <sup>a</sup>	148.800	038	244	120.0	13 June 2005
Downstream <sup>b</sup>	148.340	016	190	59.1	13 June 2005
Downstream <sup>a</sup>	148.800	035	191	62.4	13 June 2005
Downstream <sup>b</sup>	148.340	013	197	73.8	14 June 2005
Downstream <sup>a</sup>	148.340	017	189	60.1	14 June 2005
Downstream <sup>a</sup>	148.780	022	190	66.8	14 June 2005
Downstream <sup>b</sup>	148.340	014	205	72.8	14 June 2005
Downstream <sup>b</sup>	148.800	031	187	69.1	15 June 2005
Downstream <sup>b</sup>	148.800	034	200	80.6	15 June 2005
Downstream <sup>b</sup>	148.780	025	201	73.4	15 June 2005
Downstream <sup>a, c</sup>	148.780	023	208	87.3	15 June 2005
Downstream <sup>b</sup>	148.780	020	190	62.3	15 June 2005
Downstream <sup>b</sup>	148.780	026	200	74.8	15 June 2005
Downstream <sup>b</sup>	148.780	029	213	106.5	15 June 2005
Upstream	148.800	036	406	546.0	28 June 2005
Upstream	148.800	033	373	430.0	28 June 2005
Upstream	148.800	030	465	816.0	28 June 2005
Upstream	148.340	015	494	882.0	29 June 2005
Upstream <sup>e</sup>	148.800	039	327	278.0	29 June 2005
Upstream <sup>e, f</sup>	148.340	018	413	544.0	29 June 2005
Upstream <sup>f</sup>	148.780	024	360	364.0	1 July 2005
Upstream <sup>g</sup>	148.780	021	321	200.0	8 August 2005
Upstream <sup>g</sup>	148.340	012	558	1,074.0	14 August 2005
Upstream <sup>g</sup>	148.380	201	378	440.0	24 August 2005
Upstream <sup>g</sup>	148.340	018	310	280.0	30 August 2005

<sup>a</sup>= Fish released between dam and midpoint of downstream main study section.

<sup>b</sup>= Fish released between midpoint and Warm Springs Creek confluence of downstream main study section.

<sup>c</sup>= Fish captured and released in Wilson Creek confluence.

<sup>d</sup>= Radio tag was not triggered to transmit signal.

<sup>e</sup>= Fish was captured by angler.

<sup>f</sup>= Fish captured and released in Deer Creek confluence.

<sup>g</sup>= Fish captured and released by IDFG weir upstream of Deadwood reservoir.

Table 2a. Preliminary numbers of weir installation depletion electrofishing for tributaries studied in the 2005 Deadwood River Project.

Location	Date	Pass #	Species	Number	Number PIT tagged
WILS	15-JUN-05	1	RBT	18	3
			DACE	1	0
		2	RBT	14	2
			DACE	1	0
		3	RBT	8	0
		4	RBT	8	1
			DACE	1	0
WMSP	15-JUN-05	1	RBT	20	12
			DACE	9	0
		2/4	RBT	23	22
			DACE	12	0
			SCULPIN	1	0
		3	RBT	9	0
			DACE	9	0
		5	RBT	3	3
			DACE	1	0
DEER	29-JUN-05	1	UNK	6	4
		2	UNK	3	0
		3	UNK	5	0
		4	UNK	1	0
		5	UNK	0	0
WILS	30-JUN-05	1	RBT	18	13
			DACE	1	0
		2	RBT	13	6
		3	RBT	6	2
		4	RBT	9	4
		5	RBT	11	4

Table 2b. Preliminary numbers of weir removal depletion electrofishing for tributaries studied in the 2005 Deadwood River Project.

Location	Date	Pass #	Species	Number Captured	Number of RBT with recapture marks
WILS	17-SEP-05	1	RBT	46	0
		2	RBT	23	1 (PIT tag mark)
WMSP	17-SEP-05	1	RBT	40	3 (all PIT tag marks)
			DACE	38	
			SCULPIN	2	
		2	RBT	28	0
			DACE	26	
			SCULPIN	3	
DEER	18-SEP-05	1	CTT	12	2 (fin-clip marks)
			RBT	25	
			RBT x CTT	1	
			MWF	4	
			SCULPIN	13	
		2	CTT	3	0
			RBT	8	0
			RBT x CTT	0	0
			MWF	3	
			SCULPIN	12	

Table 3a. Summation of fish captured in the upstream tributary weir located on Warm Springs Creek from 6 June 2005 to 17 September 2005 by week.

Location	Direction	Week	Species	Total fish captured	New Captures		Recaptures		Mortalities New (recap)
					PIT tagged	Fin clipped	PIT tagged	Fin clipped	
UPST	upstream	1		0					
		2		0					
		3	RBT	1	0	0	0	0	1(0)
		4		0					
		5		0					
		6	RBT	1	0	0	1 <sup>a</sup>	0	0
		7		0					
		8		0					
		9		0					
		10		0					
		11		0					
		12		0					
		13		0					
		14		0					
		15		0					
UPST	downstream	1		0					
		2	RBT	1	1	0	0	0	0
		3	RBT	1	1	0	0	0	0
		4	RBT	3	3	0	0	0	0
		5	RBT	14	14	0	0	0	0
		6	RBT	14	13	0	0	0	1(0)
		7	RBT	12	0	11	0	0	1(0)
		8		0					
		9	RBT	2	0	1	0	0	1(0)
		10		0					
		11		0					
		12		0					
		13	RBT	1	0	1	0	0	0
		14		0					
		15		0					

<sup>a</sup> = Radio tagged fish recaptured at weir.

<sup>b</sup> = Mortality was PIT tagged recapture.

Table 3b. Summation of fish captured in the confluence tributary weir located on Warm Springs Creek from 6 June 2005 to 17 September 2005 by week.

Location	Direction	Week	Species	Total fish captured	New Captures		Recaptures		Mortalities New (recap)
					PIT tagged	Fin clipped	PIT tagged	Fin clipped	
CONF	upstream	1		0					
		2	RBT	4	3	0	0	0	1(0)
		3	RBT	2	2	0	0	0	0
		4	RBT	1	1	0	0	0	0
		5		0					
		6		0					
		7		0					
		8		0					
		9	RBT	1	0	1	0	0	0
		10	RBT	2	0	2	0	0	0
		11		0					
		12	KOK	1	0	0	0	0	1 <sup>c</sup>
		13	RBT	1	0	1	0	0	0
		14	RBT	1	0	1	0	0	0
		15	KOK	3	0	1	0	0	2 <sup>c</sup>
CONF	downstream	1		0					
		2	RBT	3	0	0	0	0	3(0)
		3	RBT	1	0	0	0	0	0(1 <sup>b</sup> )
		4	RBT	2	1	0	0	0	0(1 <sup>b</sup> )
		5		0					
		6	RBT	1	0	0	1	0	0
		7	RBT	2	0	0	1	0	0(1 <sup>b</sup> )
		8		0					
		9		0					
		10		0					
		11		0					
		12		0					
		13		0					
		14		0					
		15		0					

<sup>a</sup> = Radio tagged fish recaptured at weir.

<sup>b</sup> = Mortality was PIT tagged recapture.

<sup>c</sup> = Intentional mortality

Table 4a. Summation of fish captured in the upstream tributary weir located on Wilson Creek from 6 June 2005 to 17 September 2005 by week.

Location	Direction	Week	Species	Total fish captured	New Captures		Recaptures		Mortalities New (recap)
					PIT tagged	Fin clipped	PIT tagged	Fin clipped	
UPST	upstream	1		0					
		2	RBT	34	34	0	0	0	0
		3	RBT	167	41	0	44	0	2(2)
		4	RBT	75	17	25	15	15	3(0)
		5	RBT	17	0	8	4 <sup>a</sup>	5	0
		6		0					
		7	RBT	1	0	0	0	1	0
		8		0					
		9	RBT	2	0	2	0	0	0
		10		0					
		11		0					
		12		0					
		13		0					
		14		0					
		15		0					
UPST	downstream	1		0					
		2		0					
		3	RBT	81	41	0	29	0	4(1)
		4	RBT	63	16	14	16	13	0(4)
		5	RBT	30	0	20	8	2	0
		6	RBT	9	0	7	0	2	0
		7	RBT	7	0	3	1 <sup>b</sup>	3	0
		8	RBT	1	0	1	0	0	0
		9	RBT	2	0	2	0	0	0
		10	RBT	1	0	1	0	0	0
		11	LND	1	0	0	0	0	0
		12	RBT	1	0	0	0	1	0
		13		0					
		14		0					
		15		0					

<sup>a</sup> = Two radio tagged fish recaptured at weir.

<sup>b</sup> = One radio tagged fish recaptured at weir.

Table 4a. Summation of fish captured in the confluence tributary weir located on Wilson Creek from 6 June 2005 to 17 September 2005 by week.

Location	Direction	Week	Species	Total fish captured	New Captures		Recaptures		Mortalities New (recap)
					PIT tagged	Fin clipped	PIT tagged	Fin clipped	
CONF	upstream	1		0					
		2	RBT	12	12	0	0	0	0
		3	RBT	166	118	0	8	0	0
		4	RBT	145	65	49	6	2	4(0)
		5	RBT	42	0	33	10 <sup>b</sup>	2	0
		6	RBT	5	0	4	1	0	0
		7	RBT	1	0	1	0	0	0
		8		0					
		9		0					
		10		0					
		11		0					
		12		0					
		13		0					
		14	KOK	1	0	0	0	0	1 <sup>c</sup>
		15		0					
CONF	downstream	1		0					
		2	RBT	1	1	0	0	0	0
		3	RBT	13	4	0	3	0	0(6)
		4	RBT	18	2	0	1 <sup>b</sup>	0	0(4)
		5		0					
		6		0					
		7	RBT	2	1	0	0	1	0
		8	RBT	1	0	0	1 <sup>b</sup>	0	0
		9		0					
		10		0					
		11	RBT	1	0	0	0	10	0
		12		0					
		13		0					
		14		0					
		15		0					

<sup>a</sup> = Two radio tagged fish recaptured at weir.

<sup>b</sup> = One radio tagged fish recaptured at weir.

<sup>c</sup> = Intentional mortality

Table 5a. Summation of fish captured in the upstream tributary weir located on Deer Creek from 6 June 2005 to 17 September 2005 by week.

Location	Direction	Week	Species	Total fish captured	New Captures		Recaptures		Mortalities New (recap)
					PIT tagged	Fin clipped	PIT tagged	Fin clipped	
UPST	upstream	1		0					
		2	MWF	1	0	0	0	0	0
		3	MWF	3	0	0	0	0	8
		4		0					
		5	MWF	4	0	0	0	0	0
		5	CTT	2	2	0	0	0	0
		6	MWF	3	0	0	0	0	0
		7	MWF	3	0	0	0	0	0
		7	CTT	1	1	0	0	0	0
		8	MWF	5	0	0	0	0	1
		9	MWF	2	0	0	0	0	0
		10	MWF	6	0	0	0	0	0
		11	MWF	13	0	0	0	0	0
		12	CTT	1	0	0	0	0	1(0)
		13		0					
		14	MWF	1	0	0	0	0	0
		15		0					
UPST	downstream	1		0					
		2		0					
		3		0					
		4	CTT	1	1	0	0	0	0
		5	MWF	4	0	0	0	0	0
		6	MWF	1	0	0	0	0	0
		7	MWF	4	0	0	0	0	0
		7	CTT	5	0	5	0	0	0
		8	MWF	1	0		0	0	0
		8	CTT	1	0	0	0	0	1(0)
		8	RBT	1	0	1	0	0	0
		9	MWF	3	0	0	0	0	0
		10		0					
		11		0					
		12		0					
		13		0					
		14		0					
		15	CTT	4	0	0	0	0	0



Table 5a. Summation of fish captured in the confluence tributary weir located on Deer Creek from 6 June 2005 to 17 September 2005 by week.

Location	Direction	Week	Species	Total fish captured	New Captures		Recaptures		Mortalities New (recap)
					PIT tagged	Fin clipped	PIT tagged	Fin clipped	
CONF	upstream	1		0					
		2		0					
		3	MWF	1	0	0	0	0	0
		4	MWF	2	0	0	0	0	0
		5	MWF	44	0	0	0	0	0
		5	CTT	1	1	0	0	0	0
		6	MWF	8	0	0	0	0	0
		6	CTT	1	0	1	0	0	0
		7	MWF	3	0	0	0	0	0
		8	MWF	18	0	0	0	0	0
		8	CTT	2	0	2	0	0	0
		9	MWF	13	0	0	0	0	1
		9	CTT	1	0	1	0	0	0
		10	MWF	3	0	0	0	0	0
		10	CTT	1	0	1	0	0	0
		11	MWF	2	0	0	0	0	0
		11	CTT	1	0	1	0	0	0
		11	RBT	1	0	1	0	0	0
		12	MWF	2	0	0	0	0	0
		13	MWF	1	0	0	0	0	0
		13	CTT	2	0	0	0	0	1(0)
		14	KOK	1	0	0	0	0	0
		14	MWF	1	0	0	0	0	0
		14	CTT	1	0	1	0	0	0
		15	CTT	2	0	1	0	0	1(0)
CONF	downstream	1		0					
		2		0					
		3	MWF	1	0	0	0	0	1
		4	MWF	2	0	0	0	0	1
		4	RBT	1	0	0	0	0	1
		5	MWF	1	0	0	0	0	0
		5	CTT	1	0	0	0	0	0
		6	MWF	5	0	0	0	0	3
		7		0					
		8		0					
		9		0					
		10	CTT	1	0	0	0	0	0
		11	CTT	1	0	1	0	0	0
		12		0					
		13		0					
		14		0					
		15		0					

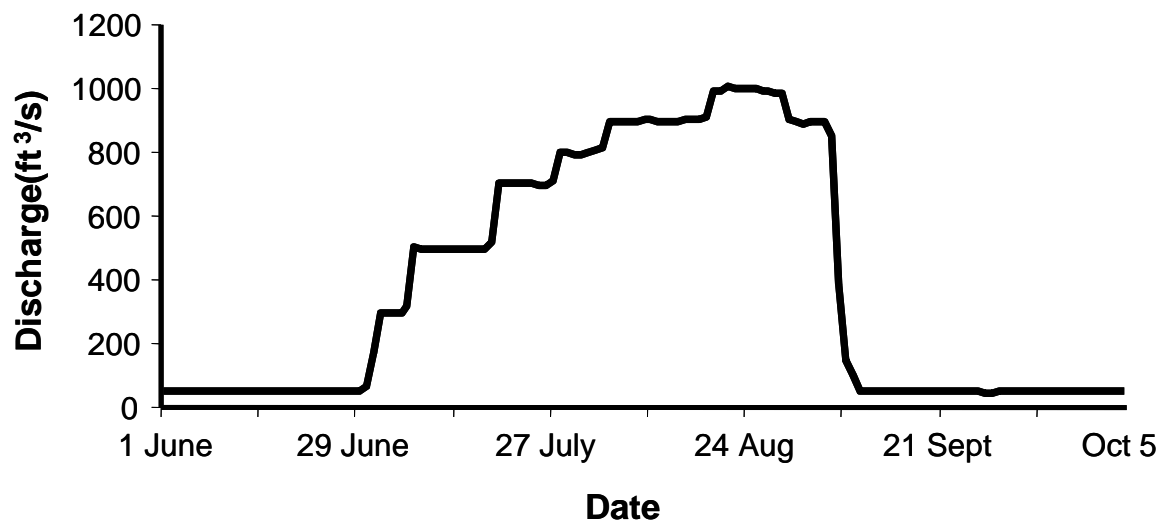


Figure 1. Discharge data for Deadwood River downstream of Deadwood Dam downloaded from USBR-Hydromet database for the period of 1 June to 17 October 2005.

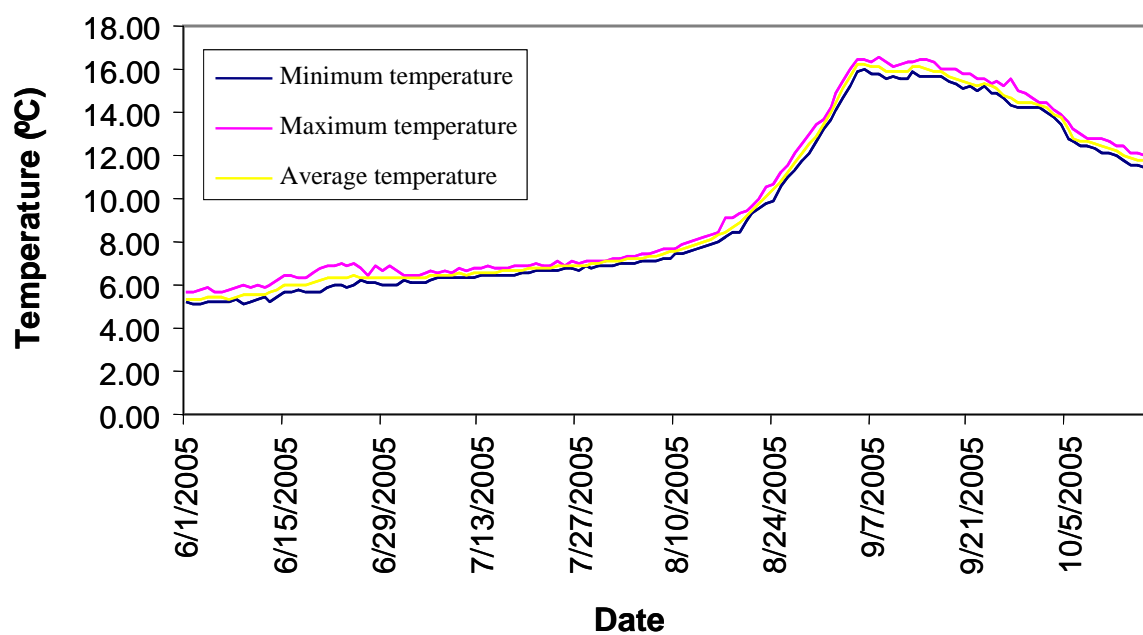


Figure 2. Temperature data for Deadwood River downstream of Deadwood Dam downloaded from USBR-Hydromet database for the period of 1 June to 17 October 2005.